

# The Greening of Software

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Even software is going green these days. There has been a flurry of activity by traditional and start-up vendors to create "green" software, which can help an organization measure where it is and then track its progress on becoming more efficient and reducing carbon emissions. Carbon awareness and carbon trading markets have accelerated since the inception of the "cap-and-trade" market system of the Kyoto Protocol to the United Nations Framework Convention on Climate Change, and in 2006 exceeded \$30 billion in total value worldwide.

"What's new is that clients are applying a 'green lens' in looking at the business fundamentals of IT, which are cost, risk and service levels," says Rockwell Bonecutter, managing partner, data center technologies & operations, at the consulting firm [Accenture](#). "But they are focusing on reducing costs, primarily."

That is a trend that has been gaining steam since early last year. Anne Stocum, manager of environmental market support at [Xerox](#), says, "We certainly have seen an increase in interest from our customers in greener approaches to computing and software in the past 18 months or so. Customers are looking to save costs, but also they want to show that they are doing the right thing, in terms of corporate responsibility."

When organizations move from paper-based processes to using electronic documents in Xerox's DocuShare solution, they become more efficient and green. Xerox also offers a software-based sustainability calculator that measures environmental efficiency.

Demand is strong for green computing domestically, but the United States is playing catch-up to its eco-sensitive European counterparts. "The EU [European Union] is certainly more mature in the green IT market," Accenture's Bonecutter adds, "although U.S. organizations are waking up to it."

Accenture has made a significant investment in developing software to help its clients become greener, and has released a suite that measures an organization's carbon footprint and helps it adjust the levers that affect emissions and energy use to model how it might move forward in becoming more ecologically responsible.

Accenture Technology Consulting and Accenture Technology Labs developed The Accenture Green Technology Suite, which was tested with clients in North America, Europe and Japan. Today, organizations can start by anonymously answering questions to step through a process for measuring their carbon footprint at a high level at [accenture.com/gmm](http://accenture.com/gmm).

Bonecutter says, "(The new green suite) was a milestone—the result of about 18 months of effort and investment. It helps customers see how they are impacting the environment. But the reasons for implementing greener solutions always come back to reducing costs, reducing risk and improving service levels."

The Accenture Green Technology Suite includes:

- The Accenture Green Maturity Model, which assesses the environmental efficiency of IT by evaluating responses to 300 questions, and then recommends steps that will help improve an organization's overall environmental standing. Accenture customizes the depth of The Accenture Green

Maturity Model and benchmarks results by comparing an organization to industry peers. Then a series of steps are prioritized and a plan is formulated.

- The Data Center Estimator provides an evaluation of the environmental and financial impact of an organization's data center(s). The tool then suggests strategies and initiatives for reducing energy use and emissions. It uses a series of what-if scenarios to see what the effect of changes in capacity demand, rising energy prices and cleaner fuel sources might have, then creates a roadmap that allows organizations to see the potential outcomes in terms of cost reduction, energy consumption and carbon output.
- The Workplace Estimator helps users move toward a greener corporate culture through telecommuting, thin-client architectures, energy savings policies, more efficient hardware and a recycling program.

Another software approach to greening data centers is using virtualization technology, where logical partitions let multiple copies of an operating system run on one physical machine. That can allow data centers to view a server farm as one large resource pool to move and optimize computing resources according to transactional peak volume demands, while shutting down machines that are underutilized during lower-capacity demand periods. The result can be drastic reductions in the number of physical servers needed to serve the enterprise. The key to reducing energy costs in data centers is reducing the number of physical servers, since it has been estimated that for every watt of power needed to run a machine, it takes 1-2 watts to cool it.

**VMware** is a global leader in virtualization technology. More than 90 percent of the Fortune 500 and 140,000 customers use VMware. When you visit the VMware Web site, the first thing you notice is a large "reduce energy costs by 80 percent" graphic about saving on power usage by going green with its software. It's become a big selling point for the company, which has made such inroads that [IBM](#), Hewlett-Packard ([HP](#)), [Dell](#), [Fujitsu](#) and [Siemens](#) servers come pre-loaded with VMware.

VMware's software is a layer that sits between the physical machine and the operating system—fooling the operating system into thinking it has control of a physical machine. That allows data center managers to move applications around based on resource needs by using a module called VMotion, instead of dedicating a machine to a particular application. They can also create capacity demand rules to operate by using Distributed Resource Scheduler. And if a machine is not needed for a while, it can be automatically powered down to a hibernation mode (most of the power needed for a server is in powering it up from a cold start) using VMware's Distributed Power Management.

The reduced need for servers and power management capabilities has produced profound results in reducing heat output, cooling requirements and power usage in data centers. It also changes the way application programmers can think about developing an application solution. Josh Leslie, director of alliances at VMware, says, "Developers can focus on thinking about how best to create the application, regardless of resource constraints on a single server."

Several start-up companies have been successful in securing customers and venture capital in the green software space. **Fat Spaniel Technologies** has more than 1,100 customers worldwide including [Wal-Mart](#) and [SunEdison](#), a utility specializing in green electricity. Fat Spaniel (named after the CEO's dog) raised \$18 million in funding in an offering last January. Prior to that, the company raised more than \$9 million. Its investors include [Applied Ventures](#), the venture capital arm of Applied Materials, which is a fast-growth firm in the solar energy business.

Fat Spaniel's software brings a video game mentality to energy savings, visually showing users what they're using and what they can save. The intuitive interface monitors alternative energy power generation. It calculates how much power a solar, wind or other alternative energy system generates, its carbon dioxide emission savings and related information, which lets users track returns and justify investments. It also monitors operation and output, so if a battery pack fails or solar panel isn't performing, Fat Spaniel Insight Manager sends an e-mail to notify operators of the problem. Also, the data from reports can be submitted to governmental authorities when applying for energy credits. In California, for instance, commercial solar systems must output over 50 kilowatts before credits are handed out.

[Carbonetworks](#), based in Canada, has about 200 customers, many of which are utility and energy providers. About half of its customers are in North America, while the other half are in Europe and the Middle East. The company raised \$5 million in funding this past July. Carbonetworks software can be considered a carbon accounting package.